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Some Diseases of Silver Foxes*

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Before beginning my talk on the rather wide subject I have chosen, namely, "Some Diseases of Silver Foxes," please let me thank you for the honour extended to me when you asked me to address you. In return for this I sincerely hope that what I have to say may not be without some interest to this meeting.

The majority of my remarks will relate to various parasites of silver foxes, for the simple reason that I have made a survey of these parasites during the last few years, working with Mr. L. A. Harvey, M.Sc., A.R.C.M., D.I.C., who is the Zoologist at Exeter University, and also being in close touch with Mr. E. L. Taylor of the Ministry's Laboratory, Weybridge. Otherwise I propose to add a few comments on some general diseases which have been encountered in the stock of about 14 fox farms in my area while in contact with them during the above-mentioned survey.

ECTOPARASITES

The most important of these parasites have proved to be the ear mange mite *Otodectes cynotis*. These can be controlled quite easily, but it was surprising to find that their presence was unsuspected in the most heavily infested stock when the survey started. I am now quite convinced that they may be most harmful in foxes. They undoubtedly cause great irritation and are therefore not conducive to that state of well-being which produces a prime pelt, and this is the object of the industry. When fits are common on a farm ear mange mites should be eliminated as a possible cause. I have found cases of meningitis which I have associated with heavy infestations. I cannot say that I differentiated such lesions from those due to fox encephalitis because at the time I did not know about the latter disease, but I do know that adequate treatment of bad infestations reduced the number of foxes which suffered from fits on the particular farm I have in mind. I now know from a series of more recent examinations that this disease has been well controlled as a direct result of my findings in the first instance.

Neither lice (*Linonathus setosus*) nor the mange mite (*Sarcoptes scabiei*) have been found in any local foxes, possibly because the bulk of the material examined has been carcases after pelting, but fleas (*Ctenocephalides canis*) and demodectic mange mites (*Demodex canis*) have each been found on occasion. Needless to say, all these external parasites are most important. For *Demodex canis* the safest measure to adopt would appear to be to kill off the affected animals; numbers of cubs in the same litter otherwise contract the disease. Actually I have encountered only one outbreak myself, but Harvey has determined these parasites when searching for ear mange mites. This led to an examination of material from a large number of foxes on the same ranch, but with negative result. The affected fox had recently returned from the Silver Fox Show in London and it is most probable that the infection was picked up there: we could not see any trouble on the farm.

INTERNAL PARASITES

LUNGWORMS.—In foxes two species of lungworms are found:—

(a) *Crenosoma vulpis*. These parasites are usually deep seated in the lungs towards the terminations of the bronchi, and their chief effect is to cause a very purulent bronchitis. American workers have suggested that this leads to a form of biosis, the worms living on the inflammatory tissue, cell debris and bacteria. Heavy infestations are undoubtedly pathogenic. The life history of these parasites has been worked out fairly recently by Wetzel in Germany. Female worms produce viviparous larvae in the bronchi of the lungs. These swarm up the air passages to the throat whence they are swallowed and pass through the alimentary canal, reaching the outside in the faeces. Externally the larvae must gain one or other of the following slugs: the grey field slug, *Agriolimax agrestis*, the black field slug (or garden slug), *Arion hortensis*, or another garden slug, *A. circumscriptus*: or they must gain

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one or other of the following snails: the Roman or edible snail, *Helix pomatia*, the wood snails, *Cetaea nemoralis* and *C. hortensis* or *Arianta arbustorum*. In these hosts the larvae grow and moult twice into infective larval stages within about seven days (0·5 mm.). Foxes then eat the slugs and snails. The larvae are liberated in the intestines and their later development is probably very similar to that of the ascarid and hookworm larvae, namely boring into the wall of the intestines, gaining a blood vessel or the thoracic duct via the lacteals and being carried in the blood stream through the heart to be arrested in the fine capillaries of the lungs. They then bore through into the alveoli and so gain the bronchi, where they grow into mature male and female worms. The migration of the larvae through the fox and the period before eggs are laid by mature females is three weeks.

From the above life history two important facts are obvious.

Firstly, a choice of the site of a farm may be very helpful as regards freedom from these fox lungworms, and in this connection it has been found in our survey that moorland sites on a comparatively acid soil are less liable to *Crenosoma* lungworms, the reason being that these acid conditions are unfavourable for the slugs and snails. Secondly, adequate control of slugs and snails appears all that is required to eliminate this lungworm disease problem in foxes. Slugs and snails may be quite easily reduced in numbers by the use of "meta" fuel tablets as outlined in the *Journal of the Ministry of Agriculture* recently. Grind up one tablet to a fine powder and mix this with 10 ozs. of bran. Place small, slightly moistened baits of this *under boards* (to protect baits from birds and animals). The board should be slightly raised from the ground by small stones. Dead slugs and snails should be removed daily, and in these circumstances I think it would be preferable to make the work doubly sure by scalding them with boiling water, in case it should be possible for the infective larvae to emerge from the dead slugs or snails and so become available to the foxes (through the agency of contaminated food, because foxes often carry it about the pen, and drop portions in their scramble at feeding time).

(b) *Capillaria aerophila*. This other species of lungworm is rather more widely distributed in my area than the *Crenosoma* species. The life history is said to be direct after maturation of the eggs passed outside in the droppings. The process takes about a fortnight before an infective larval stage is reached external to the fox. When taken in by the fox it is presumed that the larvae migrate from the intestines in precisely the same way as in the case of the *Crenosoma* larvae.

During the survey of these parasites it was found necessary to make a differential count of the sexes present for correlation of the number of females in the carcase with worm egg and larval counts. Up to this time this species had been classified as *Eucoleus aerophila* because, although a spicule sheath armed with spines was clearly seen, there was a supposed absence of a spicule. This sexing revealed that only in a small proportion of the males was the colourless spicule protruded from the spicule sheath and so rendered visible. It was quite impossible to determine it under the highest magnification possible if it was in the more common retracted position. This finding was confirmed by Baylis, who therefore classified the worm as a typical *Capillaria* species.

Mönnig, in his book on parasitic diseases, mentions the fact that slightly infested foxes may be very dangerous to other foxes, although themselves symptomless. Also that heavy infestations are often very pathogenic and lead to a chronic bronchitis in which secondary bacterial infections may cause a fatal bronchopneumonia. In the worst outbreak I have encountered, and occurring in foxes five to six months old, strongly haemolytic streptococci were found as such secondary invaders. I can therefore fully substantiate all Mönnig's statements.

In digressing, may I be permitted to mention that I came across a very virulent outbreak of husk in dairy cattle recently in which five cows and a bull were lost between August and December last. I was again able to implicate similar haemolytic streptococci as secondary invaders in one very heavily parasitized cow which died. In this case, as in the foxes, a large increase in the pleural fluid, which was blood-stained, and broncho-pneumonia were the most marked lesions found *post-mortem*.

The mature egg-laying females are usually found in the trachea and upper bronchi where they lay enormous numbers of eggs, hence the danger of slight infestations, because the infective larvae which ultimately result are extremely resistant. Adequate control of this disease therefore must depend largely on very careful hygiene. In some countries this disease became so prevalent that a system of raised wire netted floors to all pens was found to be the only effective measure of control. Examination of breeding stock for freedom from these parasites is one line of attack, but a number of examinations of faeces for worm eggs are absolutely essential if an approximate estimation of the infestation is the object. This remark applies to these fox parasites more than to any of the others as "the eggs per gramme of faeces divided by the number of female worms present in the carcase" factor, varies enormously. Some of you may have noted that

this variation was quoted by me at Bournemouth as from 0 to 15,000.

Ascarid Worms (*Toxocara canis*): These ascarid worms are quite common, and do not call for much comment. They were the only species of ascarid found in local foxes in spite of the frequent use of cats as foster mothers for young fox cubs. Otherwise I need only say that far too many cases of pre-natal infection by these parasites occur on some farms.

Hookworms (*Uncinaria stenocephala*): These hookworms are also very common parasites of silver foxes. Extraordinary infestations have been encountered at times (approximately 2,000 specimens were estimated to be present in one young cub). In our experience, although pre-natal infection is said to occur in the same way as with ascarids, neither Harvey nor myself has found any evidence of such in a large number of young cubs examined. This is admittedly only negative evidence, and we will continue to look for very early infections.

General Measures of Control.—I think you might like to know some of the general measures of control which have been tried against these internal parasites as a whole.

1. For valuable stock such as this, in which certain breeding pairs may be worth £150 or more, I think it is essential to determine the comparatively freedom from parasites of all breeding stock. It is useless to do this immediately before the mating season when, for example, it would be impossible to apply remedial measures for ascarids or hookworms and to assess their efficiency in time afterwards by worm egg count. The examinations should prove of great value in the choice of what may otherwise appear to be equally good animals. On account of the very artificial conditions under which these animals are kept, parasitic infestations should be regarded as of prime importance, and all possible means should be constantly applied for their control within bounds.

2. Clean quarters and runs for rearing are the next essential. Any system which overcomes the drawbacks of costly permanent pens and also at the same time allows movement of quarters on to new ground, or ground that has been rested for at least one year, would therefore be of benefit. Otherwise two or more times the number of pens required at any one time should be available.

3. Regular cleaning up of all droppings each day should be done. Most pens are wire netted to prevent burrowing, the wire being laid over the turf. This hinders cleaning up unless the grass is kept cut. An aid to removing the droppings is to place sand in the corners of the pens, as these are most frequently used. All the holes under the netting should be made good with soil or sand to avoid pools of water. Gravel has been used with marked success as a floor to pens, and greatly aids the cleaning up process. The best litter average for the last few years in this country (over four per vixen) has been obtained on gravel pens on a farm in Dorset. Freedom of the gravel from any iron compound, etc., which might stain the silvering should be ascertained by analysis before use.

4. Food and water utensils should be carefully cleaned. Foxes have a habit of urinating in them, and I want to speak about a bladder worm later, which is the reason for that remark.

5. The kennels, especially removable bottom boards, should be cleaned regularly. This is a weekly operation on many farms.

6. Pens should have an adequate dressing of a saturated solution of salt after occupation as the best means of killing off parasitic larvae. This should be applied during a spell of warm, dry weather. (An average pen requires about 12 gallons sprayed over it.)

7. Undue handling of foxes should be avoided.

There are only three other internal parasites I wish to mention, and these are the Bladderworms (*Capillaria plica*), Coccidial Parasites (*Coccidium bigeminum*) and the Tapeworm (*Taenia pisiformis*). I have not yet encountered *T. echinococcus* in foxes. The bladderworms may cause a marked cystitis with great thickening and haemorrhagic reaction of the lining mucous membrane of the bladder, and in the male it is said that felted masses of them may occasionally cause a plugging up of the urethra leading to death from uraemia. Such a result as the latter has not yet been determined in my area. I have, however, found very large masses of both live and dead worms present in the bladders of many foxes I have had sent me for examination. These worms may also be found in the pelvis of the kidneys. It is not yet fully understood how these parasites migrate through the fox ultimately to finish up in the kidneys and bladder. Probably the infection is a direct one, and the infective larvae may pass through the blood circulation; instead of being arrested in the lungs, they may pass into the general circulation and so reach the kidneys and thence the bladder. On the other hand, it seems equally certain that infection is probable during the act of coitus.

Concerning coccidiosis, the disease has only been found once although the parasites were encountered rather frequently.

Tapeworm (*T. pisiformis*) is quite a common finding, although heavy parasitism seems rare. Rabbit meat is often used, many farms having a supply to hand.

OTHER DISEASES IN SILVER FOXES

"Paratyphoid Disease"

Under this term I wish to refer to certain outbreaks of a septicaemic disease due to Salmonella bacteria. These were of particular interest because similar bacteria were isolated from very acute cases of disease in young cubs, on four adjoining farms, all of which were receiving meat from the same kennel supply. I sent my strains to the Institute of Animal Pathology, Cambridge, and Mr. Bosworth kindly typed two of them as being Dublin strains of these bacteria. This involved the preparation of antisera in rabbits and many agglutination tests. On account of the high cost of this work the other two strains were presumed to be the same because their cultural characters and biochemical reactions in test media were identical. This was, however, only strong circumstantial evidence against the common meat supply and I had great difficulty in preventing the farmers concerned from broadcasting my findings. Besides these apparently linked-up outbreaks of disease, Salmonella species of bacteria were implicated in cub losses on eight more occasions the same year. Most of the cases occurred during warm weather, and cubs rather than adult animals were affected.

Leptospiral Jaundice

Several interesting outbreaks of this disease have been diagnosed. Undoubtedly the elimination of rats is the essential safeguard against the disease in foxes. In one outbreak the history clearly pointed to such a source of infection. Four cubs escaped from their pen by burrowing through because of a hole in the wire netting. All died of jaundice within a fortnight, no other foxes on the farm being affected. The premises were badly rat infested and the cubs must have used their brief period of liberty within the guard fence to follow their natural instincts. On another farm a fox was seen to catch a rat and later developed the disease.

I would like to make another digression, and that is to seek information regarding leptospiral jaundice in cats.

On one rat-infested farm, a farm cat exhibited the symptoms of jaundice, while all her kittens died at about ten weeks of age, showing these symptoms. The affected animals were said always to seek water and lie in it. I should like to know if any of you have met with this condition in cats.

Encephalitis

This has proved a very troublesome disease on some farms. There is a definite history of encephalitis in most of the strains of foxes so affected. In one instance two cubs from the same litter went down with symptoms of the disease on precisely the same day although they were on different farms. At present I am unable to state if the disease we meet in this country is exactly the same as that described by Green and his co-workers in America, but several brains from affected foxes are now in process of examination with a view to elucidating this point. So far the chief lesions determined have been typical encephalitis cuffing of the blood vessels of the brain. A detailed study for cell inclusions has not yet been made. The lesions are generally unilateral and a turning to either the left or the right in a circle is the chief symptom. Fits occur, especially when the fox is approached by the attendant or a stranger, and the animal gradually becomes more ungainly in its movements and more stupid in its attitude. Some photographs I have brought with me illustrate these aspects of the disease, though admittedly not very well. Two of them definitely show the turning to the right and crossing of the fore legs.

Finally, I think you might be interested in a most unusual finding in the lungs of one fox examined during the survey of parasitic diseases. It was noted that peculiar lesions were present as small, dense nodules, sharply circumscribed, and rather flattened, especially if they were situated superficially just under the capsule of the lungs, this being the commonest situation of these lesions although small islets were also scattered throughout the lung tissue though not in close association with the bronchi. I sent portions of affected lung to Mr. E. L. Taylor, of the Ministry, thinking they were connected with some parasitic disease, with a cover note giving my opinion that the lesions appeared very firm and that they resembled cartilage. He passed them to Mr. N. Hole, the pathologist at the Ministry's laboratory, who reported back to me that the lesions had all the histological features of bone tissue. As this finding was so unusual he got in touch with Dr. Turnbull, a well-known bone pathologist, of London, about it. Dr. Turnbull reported that such lesions had been described in human cases, and that the tentative theory regarding their formation was that it followed in the wake of some chronic suppurative process leading to caseation. The particularly interesting feature of the case was that such a suppurative condition was affecting the lungs through the presence of lungworms (*Capillaria* species).

Further to this case I got in touch with the fox farmer concerned and asked him to let me examine any stock related to this particular animal. I have since examined two, only one of which was related to the first case, and both have shown lesions in their lungs which were

at least macroscopically similar. The histology of these lesions is at present under examination. In each of these latter cases a few *Capillaria* lungworms were present. In addition to such a suppurative condition of the lungs being set up by the lungworms it is also possible that migrations of the larval forms of several of the other fox nematode parasites may cause some such suppurative reaction occasionally.

I have purposely not said anything about distemper of foxes; perhaps the only interesting feature has been that I think it may be diagnosed in the initial outbreak; it does seem to be the case that further losses may be due to an increased virulence of secondary invaders following in the wake of distemper.

May I say, in conclusion, how much I welcome the opportunity of meeting so many of you whom I know, but so rarely meet except it be at times of Congress, etc.

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Discussion

Dr. Tom Hare opened the discussion, in the following terms:—

The last few remarks made by Mr. Watkins touch me rather deeply: he refers to a lesion in the lungs of a fox which was submitted by the Ministry of Agriculture to Professor Turnbull, probably the most eminent histologist in this country. I should just like to remind our Weybridge colleagues that there are also some veterinary pathologists in this country to whom these lesions are not unfamiliar as osseous metaplasia of the lung following focal necrosis, which usually is of verminous origin.

It occurred to me that our colleagues in private practice might like to know something about the routine of a fox farm. In January, the fox farmer is engaged in mating up his stock. With a gestation period of about 52 days the cubs will be born about March, when the busy cubbing season begins. The average litter size, of live cubs, is about four to five. In May and June these cubs will be ready for weaning, at approximately eight to ten weeks of age; and at that time the farmer removes his vixen from the breeding pen back to a small pen, usually with the dog fox.

In August the cubs are tattoed on the ears with a recognition mark and are moved to larger exercising compounds. In September the adults are casting their coat and thus they require grooming. At the same time the cubs are reaching their full growth; at the twenty-fourth week they should weigh from 11 to 12 lb.

The average cub strength attaining maturity on the farm is about three per vixen; in the intervening period there has been a loss of about one cub per vixen.

In October and November most farmers are busy preparing their stock for the Live Silver Fox Exhibition in London. In December the fur becomes prime and pelting begins and continues into January, which is also the period when the farmer pairs up his breeding stock. That is just a rough catalogue of the work on a fox farm, which I think all of us who attend professionally should keep in mind.

My main remarks will be in amplification of what Mr. Watkins has said. I am going to devote my attention to the practical aspect of the control of parasitic infection. Feeding defects I shall leave out entirely, although it is the most important problem next to parasitic disease, and one upon which we have far too much to say for the time available at this meeting. It might form a subject for a subsequent discussion.

I think the most important thing that we have to keep in our minds is that the spread of these parasitic infections is by means of the faeces, urine and possibly sputum—directly or indirectly; furthermore that this spread is facilitated by the principle on which fox farms are built. In my opinion the principle of layout of fox farms in this country is unsound.

Fox farming in this country started in 1920, and British farmers slavishly followed the Canadian fox ranch principle of wired pens fixed to the ground. In constructing a fox farm there are certain essential conditions we have to keep in mind. One is the nature of the animal; for its proper management and production of a marketable pelt the fox must be confined within wired pens. These pens must be enclosed in a wire guard fence, to prevent escape from within or intrusion by wild foxes, dogs and even human marauders, from without.

The second group of essentials concerns the situation of the farm. It is not advisable to site a fox farm near a main road, the traffic of which, particularly during the breeding season, might disturb the vixens. Also it is usually desirable that there should be provision of shade by trees during the summer. The soil must be adequately drained and must not deleteriously affect the pelt. All these conditions restrict the farmer's choice of land for the siting of his farm.

I want you to try and visualise a typical small fox farm—one that the farmer and his wife can manage without additional labour; *viz.*, a 20 breeding pair farm. This farm would comprise 20 breeding pens at 600 square feet each, 20 smaller pens at 200 square feet each, and exercising compounds for 60 cubs at 100 square feet per cub. Thus the minimum size of such a farm would be half an acre of ground actually occupied by pens, taking no account of spare pens, gangways, isolation unit, or the large margin necessary between the outer guard fence

and the group of pens and compounds. If another half acre is allowed for these extras, the minimum area for the 20 breeding pair farm is one acre within the guard fence. Such farms have been established without the farmer having taken into account what I personally believe to be essential, namely, a three-year rotation of his land. A plot of land should be occupied by foxes for no more than one year in three; for the two intervening years the land can be cropped by sheep, poultry or vegetables and cereals. The rotation is necessary because many of the parasites under discussion are capable of remaining viable in the ground for twelve or more months. If the ground occupied by foxes is not rested the farm within the guard fence becomes stock-sick. With a three-year rotation at least three acres is required for a 20 breeding pair farm. This makes no allowance for the farmer's own dwelling-house, sheds, farm-kitchen, food stores and so forth, so that an area of at least four acres is necessary for a small fox farm.

When dealing with parasitic infections on a farm of inadequate acreage, what are we going to do? You cannot rotate the stock and clean the ground. The system we have tried to adopt on a number of such farms is to secure the introduction of the raised floor pen, with an area of 72 square feet and with the flooring made either of boarding or of wire. The disadvantage of the wooden floor is that it warps in the wet weather, that it holds the wet, and that the faeces collect in between the boards. The farmers maintain that the wired floor damages the foxes' feet, but I have never satisfied myself that that does occur. However, the advantages of the raised floor pen are that it houses dogs and vixens (other than breeding vixens and growing youngsters) and thus saves ground area. Also the pen, by being scrubbed out each day, enables the farmer to reduce the risk of spread of the parasitic infection; moreover the efficacy of the treatment can be gauged. The disadvantages of the raised floor pen are that it increases the capital outlay on equipment; it increases the labour and it does not provide room for adequate exercise unless it contains an exercising wheel, to which the foxes will take readily. The true function of the raised floor pen is for the isolation of infected stock while it is under veterinary treatment. As a stock pen it is merely a temporary expedient for an over-stocked farm.

I advise the following measures for dealing with an outbreak of parasitic infection on a fox farm. A microscopical examination should be made of the faeces, and sometimes of the urine, of the in-contact foxes. The infected should be isolated in raised floor pens and given the appropriate treatment. The infected pens should be cleared of stock and the ground of these pens should be dressed and kept clear of foxes for at least twelve months, preferably for two years. The method of dressing the ground, which I advocate, is the old one of dressing with two tons of quicklime and 56 lb. of copper sulphate per acre. Finally the feeding and drinking utensils must be boiled daily.

Newly purchased foxes should be isolated in the raised floor pens for at least one month, during which period they should be examined by a veterinary surgeon and samples of their faeces and urine should be tested. They should not be placed in ground pens unless they are free of parasites and appear clinically in good health. New purchases are not the serious problem as in many dog kennels since fox farmers rarely purchase other than one or two special breeders, *e.g.*, in October or November.

Mr. Watkins said that he had met with haemolytic streptococci in some cases of lungworm infection. I should like him to send me a culture. During the breeding season of 1937, I isolated the beta haemolytic streptococcus, described recently by Fry and myself in the *Veterinary Record*. It is interesting to know that we have this infection in dogs, cats and foxes; and since it may simulate clinical distemper, we ought to keep it in mind in order to avoid mistakes in our diagnoses.

Professor Wm. C. Miller, invited to speak, said that if it had not been that the President had specifically asked him, he would have preferred not to have spoken since he had arrived late that evening and missed the earlier part of Mr. Watkins' paper. Some little time ago, however, the essayist very kindly showed him some of the results which he had obtained: he was not unfamiliar with the extraordinarily good work Mr. Watkins had been doing during the last two or three years down in the South-West. So far as parasites were concerned, personally he did not claim to have any familiarity with either their types or incidence, but from a very preliminary enquiry which Mr. Scorgie and himself had made into the losses which could be attributed to non-specific conditions—he should perhaps say cub losses—some quite interesting figures were obtained. He thought it might be interesting just to mention a summary of these figures for 1936 and 1937 obtained from a number of places for which returns were available.

It appeared that a very conservative estimate showed there was a loss of something between 10 and 15 per cent. of all the cubs born, and the majority of these losses appeared to be confined to the first week after birth: the fourth day after birth seemed to be the one on which the greatest number died. From weaning to maturity there was a further loss of about 5 to 10 per cent. of the total of all cubs born. The total loss, from birth to pelting age, of young cubs, was consequently about 20 to 25 per cent. on the average. He thought these figures more or less agreed with the figures mentioned by Dr. Hare: an average of four cubs born per vixen, and three of them only matured. However, that was by no means the whole of the losses, because between the time the pairs were mated up, and until cubs were born, there was

a further loss through failure of vixens to breed, and from abortions. If they added to that the number which apparently killed their cubs at or very shortly after birth, it seemed as though the general average was not very much higher than two cubs per breeding vixen mated.

He thought, from the little experience they had had so far, that Dr. Hare was quite right in saying that the major faults seemed to be associated with the question of breeding and feeding—the latter subject Dr. Hare very wisely avoided.

He was very interested to hear the remarks with regard to the control of parasites, but he was very puzzled by one point. Dr. Hare did not agree with Mr. Watkins that the use of salt was a satisfactory method for eradicating larvae from the ground, and preferred dressing with lime and copper sulphate. He hoped that Dr. Hare would not misunderstand him if he asked, given that the parasites would die out in from twelve to eighteen months only, what was his reason for leaving the pens bare for at least two years after having been dressed? If the dressing was to be regarded as effective against larvae and parasites, etc., why wait for two years before restocking?

He would like to compliment Mr. Watkins upon his useful, interesting and instructive address.

Mr. Downing observed that he was very surprised to hear Mr. Watkins state that demodectic mange was contagious. The essayist had had rather a good opportunity of checking up the theory that demodectic mange was due to an hereditary factor. He (Mr. Downing) could say that he had met with a case of true sarcoptic mange in the silver fox. In regard to lung worms, he would like to ask Mr. Watkins if he thought faeces examination for lung worms satisfactory. With sheep one found it very unsatisfactory as an index of the degree of infestation.

He did not know whether Mr. Watkins had ever tried intratracheal injections in silver foxes: he should think it would be worth a trial, and that it would not be very difficult in these animals. He would like to ask whether the *Ascaris* egg was really susceptible to even a saturated solution of salt; it seemed to him to be very resistant to most things. Turning to hookworms, did the essayist find drugs like tetrachlorethylene easy to give: he thought there was a good deal of danger, firstly from getting bitten, and secondly from inability to get the capsule down—it would be far easier to give the intratracheal injection.

Concerning *Capillaria* of the bladder, had hexamine been tried out at all?

(A Member: "It does not touch it.")

Concluding, Mr. Downing thanked both Mr. Watkins and Dr. Hare for providing him with a good deal of information that he wanted to know.

Dr. R. F. Montgomerie observed that he was particularly pleased to have the opportunity of saying how much he enjoyed Mr. Watkins' paper. It had occurred to him that copper sulphate dressings might be efficient against those slug intermediate hosts that Mr. Watkins had mentioned and that it was likely to be a much more effective way of killing them than by any method of bait traps. He would like Mr. Watkins to let them know the grounds on which he recommended soil dressing for the killing off of worm larvae and ova.

Continuing, Dr. Montgomerie said that he had wondered what Dr. Hare meant by referring to the land as being "stock-sick." He was familiar with the term "sheep-sick," but it was a little difficult to imagine the soil becoming "stock-sick" with foxes when they used it chiefly for exercise.

Some amusement appeared to have been caused by the suggestion that foxes might be trained to use a certain portion of their pens for the exercise of their natural functions, but the most important hygienic measure that could be imagined was the attempt to get foxes to use one corner of the pen as a latrine. When one remembered that to-day pigs could easily be trained to that, he wondered really if it would not be possible to arrange something of that kind in the case of foxes. If one could avoid the effects of urine and faecal contamination of the premises in which they lived and the boards and ground from which they ate, one had gone a long way.

Mr. J. S. Steward said that there was one point in the paper with which he did not agree, that was the attempt to correlate the number of female worms present with the number of eggs in the faeces. One factor which made the egg count very variable was the moisture content of the faeces: there was quite a difference in the number of eggs per gramme in a dry stool and a wet stool from the same animal. Another factor which might show great variation from time to time was the number of eggs per female of a worm species. These two factors combined to make it very difficult to estimate even approximately the number of worms present from the number of eggs or larvae per gramme of faeces. It was usually quite sufficient in actual practice to have only a rough estimate of the ova present—one's attempts at accuracy were nullified by the variable factors present in the parasites and hosts.

Mr. N. S. King desired to thank Mr. Watkins for his very interesting paper and Dr. Hare for his most informative opening of the discussion. He had gathered, perhaps wrongly, that treatment of silver foxes consisted mostly in the prevention of disease, and he must say that he felt much better when he heard that. (Laughter.) But when he heard also that they might be called upon to give intratracheal injections and to administer capsules, the thought filled him with horror.

Proceeding, Mr. King said that he would like to know if the treatment of some of those conditions—lung worm, bronchial pneumonia, etc.—was at all practicable, and if continual handling of the silver fox did not tend to make them worse rather than better.

In regard to the pre-natal infection with *Ascarides*, was that due to the difficulty of handling the vixen—the fact that she had not been previously treated?

Concerning the possibility of the occurrence of leptospiral jaundice in the cat, he could not remember having seen a true jaundice in the cat at any time except in elderly cats in cases of liver degeneration.

Miss C. M. Ford, having thanked the essayist, said that she would like to ask him, as a matter of interest, how he dealt with otodectic mange in the silver fox.

Miss M. Stewart said that she, too, would like to ask Mr. Watkins about the case of otodectic mange. She found that the majority of foxes at the show had dirty ears to some extent, but

had never stopped one for that reason. The foxes attended separately, and were not handled except by the owner. Would Mr. Watkins say how long after the show the case of demodectic mange was discovered? She believed she was right in saying that there was a bad outbreak of sarcoptic mange on one ranch about three years ago. She was on the look-out for it, but saw no cases. However, she did see a condition which simulated it with an erythema and scabbiness on the inside of the thighs. It occurred only in dog foxes and presumably was due to scalding with urine.

Tetrachlorethylene capsules were very popular as a vermicide, but as some risk attached to their use, she had tried Hewlett's Ascarine for roundworms in cubs with very good results.

The PRESIDENT said that if there was no further discussion, he felt that he must, on behalf of the Society, before Mr. Watkins replied, thank him for coming all that distance and giving them such an interesting paper, for it was a subject concerning which he, personally, knew very little: the only foxes he knew much about were those one was accustomed to chase. Nevertheless, it had been a very interesting paper to him, and it showed the result of a great deal of painstaking routine work and the fact that Mr. Watkins had made use of all the opportunities for suitable research. Mr. Watkins was, he thought, one of the pioneers, because that branch of work was a growing one, and the essayist was paving the way for very good results for the profession, both from the scientific and financial point of view. (Hear, hear.) He must also thank Dr. Hare, who was very concise and very interesting. He would now ask Mr. Watkins to reply.

THE REPLY

Mr. WATKINS said that he was afraid that his reply was going to be very inadequate for all the very interesting points that had been raised. He must thank all the various speakers for the kind things they had said, and particularly was he indebted to Dr. Tom Hare for the very generous way in which he had dealt with him.

With regard to osseous metaplasia of the lung, he was interested to hear that Dr. Hare was quite conversant with that condition: he was afraid that it was quite a new one to him. He must also thank Dr. Hare very much for going over a part of the subject which it really was so essential to know—namely, the practical management of fox farms—if any correct control measures were to be applied. He heartily agreed with what Dr. Hare had to say about the essential measure of resting the ground, and it might be interesting to his hearers to know how that difficulty had been overcome with a minimum of space in one particular farm in Cornwall. The farmer there had made long runs of netting along the ground in a series of parallel lines and his pens were totally different from the usual lay-out; they were made with collapsible sides; the top of the pen was a separate unit also. The sides leaned in a little at the top and, where they joined each other at the corners and the top, were simply held together with wire. By that means this farmer had provided himself with a plentiful supply of runs which he could use in rotation, according to the method advocated by Dr. Hare, and they had not yet come across anything that was more simple. A wooden framework for the wire netting of the sides and top was used, and the foxes did not try to bite through because the wire was wrapped on the inside of the framework. These runs had been in use now for 18 months, and they looked almost as good as they did on the day that they were put up. That method overcame the huge cost of pens which, at present, for an average-sized pen, came to about £20, including the tubular iron framework and the wire netting of the sides, top and floor.

He was interested, too, to hear Dr. Hare's observation concerning the use of the farm for other animals and poultry. He (Mr. Watkins) knew two farms where poultry were used quite extensively on the spare ground.

The question of worm eggs and larvae counts was, he thought, a really important one. He had emphasised that, in the case of one parasite, the *Capillaria* lungworm, results could be very misleading, but he thought in this case one could assess the trouble to some extent if one did not rely on one examination only. As regarded the other lungworms (*Crenosoma*), in their survey they found that there was very much greater correlation between the number of female worms present and the number of larvae passed out in the droppings; so that, in that case, it was quite sufficient to carry out one examination.

As regarded dressing of the ground, he could only say that it had been advised very largely for Canadian ranches—a dressing with a saturated solution of salt—and he did not think it would have been persisted in quite so long if it was useless. It would be quite possible to assess the value of any dressing by calculating the number of living parasitic larvae in pastures. Taylor was trying to perfect these methods, more especially as regards parasitic diseases of sheep, and as soon as they were on a working basis they would have something to go on as to what was the best dressing for these larval forms of parasites. Taylor found that, according to his average figures, a very suspect sheep pasture sample he (the speaker) sent him contained at least six times the number of parasitic larval forms compared with what would be a parasitic disease-producing dose for sheep.

Dr. Montgomerie had raised the point of the use of the term "stock-sick" ground. He would rather regard that expression as applying to parasite-filled ground than to any other meaning he could put to it, and the same meaning would apply to the "sheep-sick" ground in that case as it would to the "fox-sick" ground.

He agreed entirely with Dr. Hare as to the matter of the examination of new purchases of foxes and their isolation.

Another interesting point was in regard to the haemolytic streptococci he (Mr. Watkins) had found. He was working only in a comparatively small laboratory, and his work had tended to be all-embracing on the one hand and to be directed to getting to the root of any particular trouble on the other hand; in other words he had got very diversified work and it was very difficult for him to do all the specialist work himself. In this case he sent his cultures from the foxes to Dr. Minett as an authority on those particular bacteria, but he had no report at present as to what particular type of haemolytic streptococci they were.

He was most interested to hear about the average losses on the various farms experienced by Dr. Hare. Although, from his own experience, he could not say that the losses were always more related to the hygiene than to any other factor, the figures Dr. Hare had given and also

that Professor Miller had collected were very good average figures. One did occasionally meet with extremely serious losses on some farms. The last season was a particularly bad one in his area by reason of the occurrence of the outbreaks of disease of the paratyphoid type, to which he referred.

Professor Miller had also made mention of the killing of the cubs by the vixen. Some farmers made it a very rigid rule not to go near the vixen for a period after the cubs were born, because the slightest disturbance then did upset the vixen, and the first thing she did was to turn round on the cubs, kill them, and eat them: that again was another reason why fox farms should be in rather an isolated position, as Dr. Hare pointed out: nevertheless, he had heard of farms near the highway where the foxes apparently had got used to the traffic. He also knew of one farmer, in a small way, who claimed that he could go near his vixens at any time—certainly they were very tame, but in this case they were in good healthy condition also, which is not the usual combination to find.

Mr. Downing had raised an interesting point when he asked whether demodectic mange was contagious or whether there may be an hereditary predisposition to the disease. He could not answer that question thoroughly because he had only met with that one definite outbreak of the disease in foxes. His only way of determining it was to have the carcases dug up and making quite certain the affected cubs were from the same litter. He was very interested to hear that Mr. Downing had come across sarcoptic mange. He (Mr. Watkins) would like to say, however, that that was not the first finding of that trouble: he believed there was an extensive outbreak on a farm in Scotland some years ago.

He had not known of any intratracheal injections in foxes for lungworms: some authorities recommended that a tracheal brush be used, but that could only be effective for the egg-laying lungworms in the trachea—it would be quite ineffective against worms in the bronchi. He would admit that the *Ascaris* eggs were very resistant external to the fox. He quite agreed that there was a definite danger in capsule treatment with tetrachlorethylene for hookworm, on account of inhalation, but he had not known any fox farmer attempt to dose with liquid medicine for any parasite. He had not, as he had said before, found *Dipylidium caninum* in foxes in his area.

Another point that Dr. Montgomerie had raised was the question of the trial of rectal injections for hookworm infections, but he did not know of their having been tried. In regard to corner soiling in the pens, the sanding did help, because the corners were most often used and the system had been applied with good results on some farms as an aid to cleaning up.

In reply to Mr. Steward's observations on the correlation of the faecal worm egg count with the number of females, some species of parasite presented a much closer correlation than others: in some cases they were impossible to correlate, but one could get an average figure.

Replying to Mr. King, many practical fox farmers said that too frequent handling of their animals—or of any other animals for that matter—was very detrimental. It did check the growth of young foxes, so their great aim was to control through good hygiene, and, where handling was essential, to try something really effective in getting rid of the parasites, though they did not yet know exactly what those substances were.

Concerning pre-natal infection, he thought the reason for this was really neglect or ignorance on the part of the owner rather than the difficulty of handling the vixen at the correct time.

Coming now to the matter of the treatment of ear mange, raised by Miss Ford, control measures would be simple: one had got to employ individual treatment and treat on at least three occasions, allowing an interval of not more than about eight days between treatments. He must point out to his hearers, however, that treatment was not in his hands at all as a veterinary investigation officer, and whatever was done had to be done by the practitioner attending the various farms: he could only help by sending his reports to the veterinary surgeon who could treat the condition accordingly.

Miss Stewart had raised the question of demodectic mange found after a show. That was an isolated case where, in point of fact, one could not say that there was demodectic disease present; one could only say that parasites were present, and this finding was frightening to the owner. The case occurred in a carcase that had been pelted about one month after return from the show.

He was most interested to hear about the erythema in the dog foxes. He hoped to make a trial of some of those mixtures that had been suggested that evening, through the veterinary surgeons concerned.

Finally, he had to thank the President for the kind words he had said about his paper, which, he feared, were rather undeserved, and the whole meeting for their patient hearing.

MINERAL DEFICIENCY AFFECTING FARM ANIMALS

It is stated in the research items of *Nature* (April 2nd) that the extent and influence of mineral deficiency on the growth and reproduction of farm animals have been investigated in Canadian agricultural research centres, as well as elsewhere, and are of special interest as part of the general study of the function of minerals in the thrift of domestic stock. As an aid to the investigation, the National Research Council of Canada has published a bibliography, compiled by Muriel E. Whalley, of papers dealing with mineral deficiencies as affecting the growth and reproduction of farm animals (Ottawa, 1937). The list contains 987 numbered entries arranged in alphabetical order according to authors, and covers the literature to the end of 1936. Cross references to the principal subjects mentioned in the titles have been included to assist the reader in gaining some idea of the scope and nature of the reference listed. Under each subject there is a numerical list of relevant references. The bibliography occupies 89 pages of duplicated typescript matter. The Council announces that a single copy of the bibliography will be sent free to anyone engaged in, or with special interest in, this field of research, on application to the Division of Research Information, National Research Council, Ottawa, Canada.

ABSTRACTS

[Hexamine in Animals with Alkaline Urine. Steinmetzer, K., and Gudera, R. (1938.) *Wien. tierärztl. Mschr.* **25.** 2. 44-48. 2 refs.]

It is generally recognised that the best urinary antiseptic is one which acts by the liberation of formaldehyde. The oldest and best-known agent is hexamine which, however, only liberates its formaldehyde in an acid medium. It has always been regarded as highly efficacious in man and the dog, where the urine is normally acid, and since this splitting off of formaldehyde takes place in the kidneys, its action is not interfered with in cystitis when the urine in the bladder may be rendered alkaline.

The problem which the authors set themselves to solve was that of finding out whether or not hexamine was of value in diseases of the urinary tract of horses and cattle, the urine in each species being normally alkaline.

In the experiments conducted, an alkaline phloroglucin solution was used to detect the presence of free formaldehyde in solution, a red or pink coloration indicating a positive reaction.

From test-tube experiments it was shown that hexamine in the presence of acid urine easily liberated its formaldehyde. In neutral urine only traces were set free, whilst in alkaline urine no formaldehyde was liberated at all.

Animal experiments revealed that when rabbits were fed on oats alone and dosed with hexamine, phloroglucin added to the urine gave a weak but definitely positive reaction. When the same rabbits were fed on green food only traces of formaldehyde were demonstrated in the urine.

Two cows weighing approximately 500 kg. were each drenched with 500 gm. of hexamine in water. Urine was collected after 4, 8, 11 and 21 hours. Not once was formaldehyde demonstrated in the urine. Repetition of the experiment and giving hexamine intravenously yielded the same negative results, as did also intravenous administration in horses.

In attempting to render normally alkaline urine acid in reaction it was found that whilst ammonium chlorate *via* the mouth had no effect on the urine of rabbit, large doses of di-sodium acid phosphate caused the urine to give an acid reaction.

A 480 kg. cow was given on three consecutive days 50 gm., 100 gm. and 150 gm., di-sodium acid phosphate without altering the *p*H of the urine.

Oral odministration of citric acid, camphoric acid, benzoric acid and ammonium chlorate, also proved ineffective.

Finally, the authors carried out experiments with some of the hexamine preparations, most of which are combinations of hexamine with an organic acid.

(1) *Neohexal* was given intravenously to cows and urine collected one, three and six hours after injection was found to be alkaline in reaction and exhibited no trace of formaldehyde.

(2) *Helmitol* was given *per os* to cows and urine collected after two, four, six and ten hours was strongly alkaline and contained no formaldehyde.

(3) *Amphotropin* (Hexamethylenetetramine camphorate) (Bayer). A cow weighing 500 kg. was given 50 c.c. intravenously. Urine was collected after two and four hours. Although each sample was strongly alkaline, in each case formalin was readily demonstrable. This experiment was repeated two days later, urine being collected after one and three hours. Results were the same as before.

Two horses weighing 600 kg. received 50 c.c. amphotropin intravenously. Urine collected from both animals two and three hours after injection was strongly alkaline but a strong positive phloroglucin reaction demonstrated the presence of formaldehyde.

To summarise, hexamine is of no value as a urinary antiseptic in animals with strongly alkaline urine as in the horse and cow. The preparation known as amphotropin can liberate its formalin content in an alkaline urine. It is, therefore, of value and appears to have no deleterious effects on the subject.

C. F.

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[Studies on the Effect of a Diet Deficient in Vitamin A on Lungworm Infestation in Sheep. Shaw, J. N. (1937.) *N. Amer. Vet.* **18.** 10. 25-27.]

Six two-year-old wethers were placed on a vitamin A-deficient diet consisting of well-bleached wheat straw, oats and beet-pulp. After 19 months on this diet clinical signs of vitamin A deficiency—muscular inco-ordination, night blindness, and urinary calculi—were evident in all the animals. On being given a heavy dose of infective-stage lungworm larvae it was found that these six vitamin A-deficient sheep did not show any increased susceptibility to lungworm infestation as compared with sheep fed on a normal diet.

An interesting finding, however, was the tendency for the diet to promote the production of renal calculi, which on analysis were found to be 95 per cent. silica. This confirmed the findings of several other workers who have shown that a vitamin A-deficient diet can produce renal calculi in rats and human beings and of others who have found that in the case of human beings a recurrence of renal calculi can be prevented by a diet rich in vitamin A.

J. S.

[**Rapid Milk Agglutination Test for** *Br. abortus*. (Trans. title.) Ehrlich. (1937.) *Zschr. Infektkr. Haust.* **52.** 163-179.]

This is the report of a detailed comparison of the relative value of the "rapid slide agglutination test" of milk for the presence of Brucella agglutinins and the orthodox "tube agglutination test." The actual technique adopted in the rapid slide test did not differ materially from similar methods which have frequently been described. As result of careful tests it was found that 5 per cent. saline was the best diluent for reagents, undiluted dye-impregnated *Br. abortus* suspension gave the clearest results, and tests prepared by mixing milk and this antigen on a suitable dark glass plate could be read with the naked eye after five minutes' incubation at room temperature. Milk up to eight days old gave good results.

As a method of diagnosing Brucella infection in cattle this "rapid milk agglutination test" was definitely inferior to the blood serum agglutination test. (Since antibodies only filter through into the milk in a certain proportion of all infected lactating cows this conclusion was expected.) When this rapid test was compared with the isolation of *Br. abortus* from milk there was a considerable disagreement. (Since cows excreting antibodies in the milk do not necessarily have udder infections this conclusion was also expected.)

In a final analysis in which the relative value of the rapid and slow milk tests was compared, out of 1,044 such comparative tests there was agreement only in 73·9 per cent. of cases. It is concluded, therefore, that whilst the rapid test may be extremely useful to veterinary practitioners who are not in touch with laboratories, it is not suitable for general adoption.

E. J. P.

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[**Rational Treatment of Mange in Animals.** (Trans. title.) Demianovitch. (1937.) Bulletin de l'Office International des Epizoöties. **14.** 318-328. (May to June.).]

Because of its therapeutic efficacy, innocuity and simplicity in use, Demianovitch considers that the method of treating mange in humans which he introduced in 1922 and later improved and then modified and applied to animals in 1933, is much to be preferred to the older methods of medication with ointments, liniments, dips and fumigation, which not only require considerable time but may also have an injurious influence on the skin and general health of the patient.

Essentially, the method, which the author describes in detail, consists in the application of a 60 per cent. solution of sodium hyposulphite followed by a 10 per cent. solution of hydrochloric acid to the animal after it has been clipped and washed to remove scabs and crusts. The treatment is repeated two to three days later. The sulphur and sulphurous gases, as well as the intermediate products, *e.g.*, thiosulphuric acid, which result from the chemical decomposition of the solutions used, appear to have a vigorous acaricidal action. The author claims considerable success for his method in the treatment of all forms of mange in horses, psoroptic mange of sheep, sarcoptic mange of camels and reindeer, ocular mange of the rabbit and demodectic mange of dogs.

J. N. O.

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[**The Influence of Variations in the Dietary Phosphorus and in the Ca : P Ratio on the Production of Rickets in Cattle.** Theiler, A., Du Toit, P. J., and Malan, A. I. (1937.) *Onderstepoort J. Vet. Sci. and Anim. Husb.* **8.** 1 and 2. 375-413.]

The experiments reported in this paper were undertaken to gain information on the nature of the osteodystrophic diseases produced respectively by Ca and P deficient rations in cattle. Observations were made over a period of 24 months on heifers (15 months old at commencement of the experiments) fed on a basal ration low in Ca and P but considered adequate in vitamin D. In one series of experiments the animals were divided into six groups of two. One group in which the basal ration was supplemented by adequate Ca and P was kept as a control, while in the other five groups the amounts of Ca or P or both, were varied. The daily retention of P in the control group amounted to 15 gm. P_2O_5, whereas in three groups receiving inadequate amounts of P the retention of P_2O_5 was little more than 1 gm. per day. The authors comment that it is remarkable that these animals grew and remained alive for two years on the small amount of P_2O_5 retained.

A second series of experiments with steers corroborated in the main the results obtained in the first series.

The outstanding result of the experiments is that P deficiency in bovines invariably leads to rickets or osteomalacia and that osteodystrophia fibrosa is not produced by P deficiency *per se*. With regard to the latter condition, the suggestion is made that Ca deficiency may be the responsible factor. A daily intake for the steers of 19 gm. P_2O_5 of which 53 per cent. was retained and, for the heifers of 24·0 gm. P_2O_5 of which approximately 63 per cent. was retained, provided sufficient P for normal growth and development, while 13 gm. and 10 gm. were insufficient for the steers and

heifers respectively. Decreased food consumption which has invariably been observed in cattle receiving insufficient amounts of P in the diet is apparently an effect of a disturbance in the Ca : P metabolism of the animal and not wholly due to inadequacy of P.

N. J. S.

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[**The Specificity of the Virus of Rabbit Myxomatosis.** Bull, L. B., and Dickenson, C. G. (1937.) *J. Counc. Sc. and Ind. Res. Australia.* **10.** 4. 291-294.]

The authors endeavoured to infect a large variety of species of wild and domestic animals in Australia with the virus of rabbit myxomatosis. All experiments were completely negative and they conclude, in common with all other investigators, that this virus is highly specific, affecting only the European rabbit (genus Oryctolagus) and not even any other species of rabbit. Since the Australian rabbit is of European origin and susceptible to the disease (369 were artificially infected and none recovered) it is suggested that the virus may be used in safety for the control of the rabbit population of Australia.

P. S. W.

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[**Removal of Unwanted Lactation in the Bitch with Oestrone.** Witzigmann (1938.) *Tierärztl. Rdsch.* **1.** 7-9.]

In the author's experience, local treatment has not proved satisfactory for stopping milk secretion in bitches affected with phantom pregnancy. This condition is apparently due to an endocrine disturbance and the evidence seems to indicate that one of the ovarian hormones is responsible. Twenty-four cases of phantom pregnancy were treated with a proprietary preparation "Provetan," which is an oily solution of dehydrofollicle hormonbezoate oestrone. Dosage varied from 5,000 to 30,000 I.B.U. given subcutaneously in one to four injections. In most of the cases milk secretion ceased and the gland returned to normal size in three to seven days. In two cases the injections had no effect. An undesirable feature of the treatment was that six to nine days after the first injection symptoms of oestrus occurred and lasted for six to eight days.

N. J. S.

An American Holstein cow, Fenton Alma, in a Western Minnesota herd, has created a new world record for junior two-year-olds by producing 20,582 lb. of milk and 1,002 lb. of butterfat (test 4·9 per cent.) in 365 days.

REVIEW

The Horse Owner's Reference Book

It is fortunate in these days of mechanical transport that there is a Society such as the National Horse Association of Great Britain to keep the flag flying for our friends the horse and his owner. Since 1922 the record of this Society has been one of continuous activity and vigilance on behalf of the horses and horsemen. A perusal of the Horse Owners' Reference Book will satisfy even the most sceptical that the horse is not dead yet. On turning the pages, one is amazed at the variety and amount of interesting information therein set forth. One could scarcely imagine that in these days, 172 pages could be so packed with information dealing primarily with the horse and his associations. The extraordinary growth of the interest taken in horse riding must be ascribed to the reaction against things mechanical and the rush and tear of modern life. Parents and others are to be commended when they encourage their youngsters to develop the healthy and safe cult of the horse or pony, rather than that of the dangerous and inanimate steed of petrol and oil.

The book contains 500 to 600 dates of fixtures in which horses and ponies will participate during the year in all parts of the country: a classified list of riding schools with the facilities available at each school is also included. Sixteen pages are devoted to interesting statistics in which are included information dealing with racing and other records. There is also a wealth of information concerning the numbers of horses in various countries and towns, with the horse breeding Acts, railway and transport charges, etc.

It is interesting to note that the report of the R.C.V.S. and N.V.M.A. on the Colours and Markings of Horses occupies a prominent position in the work.

The book is as comprehensive as its title suggests; its information is unique and it well repays the small cost of 1s. net, 1s. 2d. post. It is published by the National Horse Association of Great Britain, 12, Hanover Square, London, W.C.1.

A call for research into the cause of diseases in pigs in view of the high mortality was made by Mr. J. W. Pearson, President of the British Oil and Cake Mills National Bacon Pig Competition, at a luncheon at the Savoy Hotel. He said that the competition had been abandoned because of a breakdown in the contracting section. Pigs multiplied at a greater rate than any other mammal except the rabbit, yet mortality was very high and many of the diseases were obscure. If we were to produce the amount imported we should have to double the number of pigs in this country.

The Veterinary Record

April 23rd, 1938.

Over Two Thousand Strong

IN recent times the addition "this figure constitutes a record" has become a constant feature of the routine announcement of the membership total at meetings of Council, N.V.M.A. We feel, however, that the statement made at the April meeting (the proceedings of which will be recorded in an early issue) that the number of members now stands at 2,038, represents an event meriting rather more emphasis than the Council accorded it.

Actually, of course, this attainment of the goal—albeit an interim one—of a membership of two thousand, for which the Association has striven since, in 1920, with the purchase of the *Veterinary Record*, the numbers rose from 375 to 1,115, is a landmark of great moment in the history of the N.V.M.A. Its significance is enhanced by the fact that whereas in the earlier years of the period it was a matter of striving "each painful inch to gain," more recently nomination lists of 50 and over have preceded that presented at the meeting in question, when the election of 66 new members carried the total so well in advance of the "good round figure" previously aimed at.

The fact that the Register of Members R.C.V.S. contains the names of 3,597 veterinary surgeons reveals the challenge and the incentive to further effort inherent in the achievement we now acclaim. In these days the "National's" case for increased numerical, which embodies financial, support represents a forceful alliance between the sentiment of association and the substantial advantages which membership has to offer: not otherwise would there be forthcoming this convincing evidence that the profession is rapidly belying its reputation for apathy and is becoming unity-conscious. There is scarcely a field of veterinary endeavour in which the efforts of the N.V.M.A. to advance the interests and prestige of the profession as a whole and of the individual veterinarian have not yielded gratifying results, and the increasing momentum of the response to the special membership campaign initiated by our Past President and prosecuted with such vigour by the present Head of the Association, is an index of the appreciation felt for those endeavours throughout the British veterinary world.

Members—and even more non-members—will be well advised to study possibly more closely than they do, reports of the Association's standing and special committees. They reveal the diversity and importance of the activities of the Association in directions without number, included in which may be mentioned approaches to Government departments or to Parliament itself in the interests of those engaged in the State, local authority, or colonial services, or in private practice; the safeguarding of collective and individual interests and the redress of grievances; the maintenance of contact with colleagues overseas; the promotion and prosecution of scientific enquiries and the dissemination of information thus obtained; the publication of a scientific journal functioning also as a veterinary newspaper, and the conduct of a great annual congress.

This list, which typifies rather than represents the responsibilities of the Association, may serve to indicate the extent to which the "National" of to-day is called upon to speak and act for the veterinary profession, the duties of the Royal College being strictly limited by statute. The vital point about our having "topped the two thousand" in so great a stride is that it diminishes the danger that the organisation so carefully and soundly created and developed by our pioneers will become functionally overweighted. Nevertheless a comparison of the membership figures of the N.V.M.A. and R.C.V.S. reveals that the machine is still running far short of its potential efficiency, the exercise of the influence of the Association being proportionately restricted in consequence. The experiences of the past few months, perturbing as they have been to a very large section of our colleagues, will have served at least one salutary purpose if they drive home the lesson that, in the times in which we live, nothing less than a fully representative Association is adequate to meet the needs of the profession. To those who continue to linger beyond our borders, therefore, we would address the words of a former President: **"Let us see to it that we show ourselves as capable of giving support as of receiving it."**

NATIONAL VETERINARY BENEVOLENT AND MUTUAL DEFENCE SOCIETY

ANNUAL MEETING AT MANCHESTER

The Annual General Meeting of the National Veterinary and Mutual Defence Society was held in the Town Hall, Manchester, on Wednesday, March 30th, 1938, at 3 o'clock p.m.

Mr. Wm. Woods occupied the chair, and there were also present Messrs. G. Mayall, G. H. Locke, E. H. Curbishley, A. J. Wright, J. Spruell, J. H. Wright, F. Hopkin (Hon. Treasurer), and R. C. Locke (Hon. Secretary).

Apologies for unavoidable absence were received from Messrs. Holroyd, Hobday, Watson, and Jackson Young.

The minutes of the last Annual General meeting and of the Extraordinary General Meeting were passed and signed.

Election of Officers

President.—Mr. Wm. Woods, Wigan.

Vice-President.—Mr. J. Clarkson, Garforth.

Council.—Mr. A. J. Wright, Macclesfield; Sir F. T. G. Hobday, London; Messrs. J. Holroyd, Blackburn; E. H. Curbishley, Alderley Edge; D. Imrie, Glasgow; J. H. Wright, Manchester; F. L. Gooch, Stamford; J. Spruell, Manchester; W. Shipley, Great Yarmouth; A. Cornish Bowden, Beckenham; W. K. Townson, Peterborough; O. V. Gunning, Tutbury; R. Barons Nelder, Exeter; G. H. Locke, Manchester; G. Mayall, Bolton; W. D. Rees, Glamorgan; H. W. Dawes, West Bromwich; and H. Sumner, Liverpool.

Hon. Treasurer.—Mr. F. Hopkin.

Hon. Secretary.—Mr. R. C. Locke.

Auditors.—Mr. J. Adamson (Honorary), and Messrs. Litton, Pownall, Blakey, and Higson.

Financial Report

The Hon. Treasurer, Mr. F. Hopkin, then gave his financial report for 1937. He stated that the year had been a very satisfactory one in many ways. The amount received from subscriptions and arrears of same had been greater than for some time past, while the membership had increased by a small number, despite the fact that the Society had lost quite a number of members through death and a few had been removed from membership on account of non-payment of subscription. During the year no less than five beneficiaries of the Society had died. This was an unprecedented number and, as a result, he hoped that there would be an increased amount of money available for the relief of necessitous cases in the ensuing year. Defence costs had not been heavy despite the fact that they had had to deal with eight cases during the year. He thought that result was a tribute to the manner in which the Society had advised its members, and also the way in which the cases were fought should the necessity arise.

The financial statement was unanimously approved and adopted.

The meeting concluded with a vote of thanks to the President.

R. C. Locke, *Hon. Secretary.*

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Defence Cases

1. Threatened counter-claim against member for alleged negligence in treatment of dog. Advice given and arrangements made for expert evidence for the defence. Claim not proceeded with.

2. Threatened counter-claim against member for alleged negligence in dental treatment of dog. Case settled amicably. Society paid costs incurred.

3. Counter-claim lodged against member alleging negligence in treatment of a cow. Society defended the claim. Judgment given in favour of member.

4. Dispute between member and client following examination of a thoroughbred for soundness. Society gave advice and support to the member. Case dropped by the client.

5. Threatened action against member alleging negligent treatment of a cow by his assistant. Society gave advice and support to the member. Case dropped by the client.

6. Threatened action against member alleging negligence in connection with the examination of a horse for soundness. Society gave advice and support. No further development.

7. Threatened counter-claim against member alleging negligence in treatment of cattle. Society gave advice and support. Claim withdrawn. Society paid legal charges incurred by member.

8. Threatened claim for damages against member for alleged failure to diagnose disease in a dog. Society gave advice and arranged for expert evidence to be available for the defence. No further development.

Benevolent Cases

M.J., 87, Widow, £2 per month, plus an emergency grant of £3.

K.L.H., 85, Widow, £2 per month.

L.H., —, four children, £4 per month.

M.D., 64, Widow, £3 10s. 0d. per month.

E.B.C., 55, Widow, £2 per month.

M.A., 42, Widow, £2 10s. 0d. per month.

M.B.B., Daughter, £2 per month.

K.E.C., 73, Widow, £2 per month, plus emergency grant of £5.

S.Y., 80, Widow, £3 per month.

E.M., 73, Widow, £1 per month.

(*Concluded at foot of col.* 1, *page* 495.)

N.V.M.A. DIVISIONAL REPORT

Central Veterinary Society

A meeting of the Central Veterinary Society (Division, N.V.M.A.) was held at the Conway Hall, Red Lion Square, W.C.1, on Thursday, March 3rd, 1938, when the Fellows heard with much interest, and discussed at length, a valuable paper on "Some Diseases of Foxes," presented by Mr. C. V. Watkins, M.R.C.V.S., D.V.S.M., of the Seale Hayne Agricultural College, Newton Abbot, Devon.

The President, Dr. J. McCunn, occupied the chair, and there were also present Messrs. W. Brown, H. E. Bywater (Hon. Secretary), W. H. Chase, W. Downing, Miss C. M. Ford, Major R. C. G. Hancock, Dr. Tom Hare, Miss K. Hernaman-Johnson, Sir F. Hobday, Messrs. J. W. H. Holmes, N. S. King, Major Glyn Lloyd, Mr. A. B. MacIntyre, Professor Wm. C. Miller, Mr. G. H. Mills, Dr. R. F. Montgomerie, Major G. E. Oxspring, Mr. W. A. Pool, Miss Katharine Sanderson, Messrs. N. J. Scorgie, J. S. Steward, Miss Marion Stewart, and Mr. J. T. Turney.

The following visitors were present: Miss A. W. Greener, Messrs. M. G. Hignett, S. L. Hignett, E. Kaufman and C. V. Watkins.

The minutes of the January meeting of the Division had been published in the *Veterinary Record*, but the President observed, in regard to them, that the Fellows would notice that those minutes were merely a record of the business section of the proceedings. A full report was taken of the discussion on R.S.P.C.A. clinics, but in accordance with the decision of the meeting it was not forwarded for publication, but to the appropriate Committee of the N.V.M.A. for its information.

The minutes, as indicative of the business of the meeting, were then confirmed and signed.

Correspondence.—(1) From Captain L. S. Balls, Mr. Cyril King, Captain J. F. Macdonald, Mr. E. F. McCleery, Major-General Sir John Moore, Mr. E. L. Stroud, Mr. Alex. Thomson, Mr. J. F. D. Tutt, Mr. J. Willett, Professor G. H. Wooldridge, and Dr. W. R. Wooldridge, apologising for their inability to attend.

(2) From Mrs. P. S. Howard, thanking the Society for the wreath sent to the funeral of her late husband and also for the letter written conveying the sympathy of the Fellows.

A.J.P., 66, Widow, £2 per month.
S.J., 72, M.R.C.V.S., £2 per month.
L.M.R., 42, Widow, £4 per month.
E.J.C., 82, Sister, £2 per month.
W.C., 82, M.R.C.V.S., £2 per month.
E.H., 60, Widow, £52.

(3) From Captain J. Fox, who was taking up residence at Taunton, intimating his desire to resign from the Society on that account. Captain Fox's resignation was accepted with regret.

(4) Letters from the Trustees of the Society, Messrs. E. L. Stroud, J. Willett, and Sidney Villar, acknowledging with thanks the letter of appreciation addressed to them by the Society for the work which they had done on its behalf in their capacity as trustees, and expressing approval of the decision to transfer the funds to the Society's bankers.

(5) From the Secretary of the Royal Sanitary Institute Congress, inviting the Society to send a delegate or delegates to the Health Congress of the Institute to be held at Bournemouth in July.

The President, speaking on this matter, said that the Society had decided previously that they should not send a delegate to the Royal Sanitary Institute Congress, because one was sent by the N.V.M.A., and they felt that that delegate should provide the report. Mr. Bywater, who had represented the Society very acceptably over a number of years in the past, had pointed out to him, however, that with the reorganisation of the veterinary profession there might be a very small attendance at this year's Congress from representatives hitherto employed in the local authority service, who had been in the habit of attending, and it might, therefore, be the case this year that the attendance at the Veterinary Section would not be quite worthy of the profession in point of numbers, and the Veterinary Section of the Congress might be overborne by other representatives. Their Hon. Secretary had intimated to him that he was prepared to go to the Congress as the Society's delegate, but that he did not wish for any expenses.

Mr. King proposed that Mr. Bywater's offer be accepted with gratitude; as the President had said, their Hon. Secretary had attended on their behalf with great benefit both to the profession and the Society for many years, and it would be a very good thing if he would continue to do so.

Mr. Steward seconded the proposition, which was carried unanimously.

(6) From the General Secretary of the N.V.M.A., thanking the Society for the resolution which was passed with regard to the new Veterinary Services which were being established by the Ministry of Agriculture. The Fellows might remember, observed the Secretary in this connection, that the resolution was passed when the negotiations had been broken off between the "National" and the Ministry: it expressed confidence in the Consultative Committee of the "National" and thanked that body for its efforts on behalf of the profession.

Obituary.—The President stated that since they met there last time, the Society had lost two members — both very old members and valued Fellows, namely, Mr. Percy Howard, of Wanstead, and Colonel Dayer-Smith. Both were very quiet, reserved, gentlemen, but were at one time very constant attenders at the meetings of the Society. Colonel Dayer-Smith kept up his regular attendance until a few years ago. Both of them shunned publicity, but they were both sound and admirable members, and Colonel Dayer-Smith was very useful to the Society in committee: for many years he was looked upon as their financial expert.

In both cases letters had been sent to their relatives on behalf of the Society, and wreaths to their funerals, at which the Society had been represented. The Fellows stood for a moment in silence in tribute to the memory of their deceased colleagues.

Elections to Fellowship.—The following elections to Fellowship were unanimously made: of Dr. R. F. Montgomerie, Wellcome Physiological Research Laboratories, Beckenham (proposer, Mr. A. B. MacIntyre; seconder, the Hon. Secretary); Mr. Alex. Thomson, Wellcome Physiological Research Laboratories, Beckenham (proposer, the President; seconder, Mr. A. B. MacIntyre).

Subjects of Professional Interest

The Hon. Secretary, on behalf of Mr. J. F. D. Tutt, of Winchester, submitted three X-ray photographs with the following descriptions:—

(1) Suspected abdominal obstruction in terrier. The X-ray shows several pieces of bone in the abdomen, one in the stomach, rather large, and three in the bowel in an incompletely digested state. A few macerated pieces are visible in the colon. There is no sign of obstruction.

(2) Film showing piece of wire in abdominal cavity of bull terrier. The interesting point about this case is that the patient showed no signs of serious illness to within 48 hours of death. The only symptom was a persisting high temperature. Appetite, etc., were normal. Following the X-ray, an operation was performed, revealing the piece of wire, but death occurred owing to peritonitis.

(3) Film showing obstruction in bowel of Airedale terrier. This proved to be a piece of cork with a yard or more of twine attached. Recovery after operation was uneventful.

Major Hancock exhibited an instrument, devised by him some time ago, for scaling teeth in dogs. There was a small depression at one end of the forcep-like appliance: this was placed at the extremity of the teeth, the instrument acted as a kind of fulcrum which gave one a great deal of power, while the depression prevented the instrument from slipping off the teeth while the scaling was in process. He might say that he had very great difficulty in getting the instrument made, but it was going to be produced by Davis's of Great Portland Street.

Major Oxspring commented that it appeared to him to be a very useful instrument, and he was glad to know where to get it.

With regard to Mr. Tutt's X-ray photographs, he could not see very much in the first, but he thought they would often find that pieces of bone remained in the stomach in an undigested state. Concerning the second film, the interesting point would be to know whether a piece of wire of that size and shape could reach the site at which it was found without perforation. He would suggest that there had been perforation.

The President said that as one read the letter, it would appear that the wire was situated outside the intestine. If he had that case with the wire in the intestines he would have followed the method practised by Mr. Hodgman, *i.e.*, of boiling a rabbit and giving it to the dog skin and all, having removed the bones; the skin would have surrounded it, and that would have been as effective as giving, as he usually did, cotton wool for the same purpose.

Paper.—The President now called upon Mr. C. V. Watkins to present his paper, "Some Diseases of Foxes." Mr. Watkins's paper was heard with great interest, and prompted an extended discussion, this being opened by Dr. Tom Hare.

[Mr. Watkin's paper is reproduced, together with a report of the discussion and the essayist's reply thereto, at the commencement of this issue of the *Record*.—Editor.]

On the call of the President, a very hearty vote of thanks was accorded the essayist for journeying from Newton Abbot to present so interesting and valuable a paper to the Central Veterinary Society.

"Dalrymple-Champneys" Prize

The next business before the meeting was to receive nominations for the "Dalrymple-Champneys" Prize.

The President proposed that the Society should nominate Mr. J. S. Steward as the recipient of this award for this year. In commending his proposition to the meeting, Dr. McCunn reminded the Fellows of the remarkable piece of work done by Mr. Steward on the life-history of the *Onchocerca cervicalis* in association with the causation of poll-evil and fistulous withers.

The proposition was seconded by Mr. Nevill King, and carried unanimously.

There being no other business, the President declared the meeting closed, being warmly thanked for his conduct of the proceedings.

H. E. Bywater, *Hon. Secretary.*

IN PARLIAMENT

LORDS DEBATE FOOT-AND-MOUTH DISEASE

As indicated in our last issue, a debate on foot-and-mouth disease took place in the Lords before the House rose for the Easter Recess.

Lord Nunburnholme called attention to the recent outbreaks of foot-and-mouth disease, and asked his Majesty's Government if they had considered the question of taking further measures to limit transport and access from one parish to another in infected areas.

The noble lord, who also moved for papers, congratulated the Government on the efficient way in which they were handling the situation in the Midlands. He said that so much depended on the co-operation of the local authorities, police and general public, in carrying out the measures that more publicity was essential. In Northamptonshire they were having fresh outbreaks every day.

The method of checking the disease which was considered most efficient was isolation. The people in the rural areas were fully alive to the situation and understood the farmers' difficulties. It would be a good thing to appeal to the urban population in connection with the holidays to keep out of the infected areas and, if they had to go into such areas, to try to keep within them. They should also pay particular attention to the question of entering fields with cattle grazing, for a gate left open might mean that cattle might stray out of an infected area into a free area. The gravity of the situation should be emphasised through every available channel.

There was also the question of people in one parish keeping themselves as isolated as possible from the people in other parishes. He believed it was the case that in the West of England children from an infected farm went to school in the next parish, which was free, and the next outbreak of the disease was in the school field. Could the Government start a scheme whereby livestock breeders and milk producer-retailers could insure with the Government against the consequential loss of their businesses?

Government Reply

The Earl of Feversham, Parliamentary Secretary, Ministry of Agriculture, congratulated the noble lord on his maiden speech and continued that it was disappointing that, after the epidemic which began in the south-east counties last October had been wiped out, a fresh series of outbreaks should have begun. The outbreak which began on March 25th had, so far as they knew, no connection with the previous epidemic. It appeared to take a longer time to show its presence in the animal. In the last epidemic the series of outbreaks appeared simultaneously over many parts of the country. The disease arrived without warning or evidence of definite centres from which it was spreading. That led them to connect that epidemic with the migration of birds from the Continent, which was going on at that time.

In the present case, although the outbreaks had occurred in widely separated places, the evidence led them to believe that infection was picked up at certain definite centres, certain important markets in the Midlands, which, taken together, distributed stock over the greater part of the country. Those two facts meant that they had had a longer period of notice of what might happen and that there was the possibility of such a wide distribution of the disease that there was danger of one of the worst outbreaks that this country had ever known occurring.

The Standstill Order

In those circumstances what action were the Ministry to take? It was essential to check any further distribution of the disease by the movement of animals, and it was necessary to obtain a breathing space so that they could track down every single animal which might have been exposed to infection and place under restriction every undisclosed centre of the disease. By thus overtaking the spread of infection the danger would be largely averted, and the task of eradication made more rapid and effective.

That was why, in addition to the usual declaration of infected areas and the restrictions within those areas, the Ministry decided that they must impose a Standstill Order on the whole of England, with the exception of certain counties in the far north and the far west. This restriction was not just a matter of red tape; it was a measure dictated by the most elementary foresight; it was a measure to meet any emergency and what might have proved to be a possible disaster. They realised the inconvenience of such a measure at such a time of year. It was indeed because of the time of the year and the wide distribution of livestock that took place now that such drastic steps had to be taken in this interim period until they had further information. The tracing of the animals that were exposed at these suspected markets was proceeding as fast as possible, and they hoped to complete the investigation at an early date.

Since April 4th, when the Standstill Order was imposed, four new centres of disease had appeared. The Ministry considered that these further outbreaks had justified the imposition of the Standstill Order, but the facts so far available indicated that the actual spread of infection would not prove to be so serious as at first they anticipated. If, within the next few days, this view was confirmed, and the Minister was satisfied that the spread of the disease had been checked, they anticipated that a substantial reduction of the controlled area would be possible, even if it was proved impossible entirely to withdraw the order covering those parts closest to the infected area.

Restrictions on the Continent

Having explained the local restrictions which were imposed in the case of an infected area, the noble Earl said he understood that Lord Nunburnholme had taken these precautions on his own farm and that wide advantage was taken of these powers by agriculturists generally. Those measures had been severely tested over a number of years and had well stood the test. They conformed fully to the recommendations of the Departmental Committee which sat in 1924 and investigated the series of outbreaks that occurred at that date. That committee stated that restrictions on the movement of human beings, except within the actual infected places, could not be justified.

The Ministry were aware that in some countries on the Continent more severe restrictions had been imposed. He understood that churches and cinemas had been closed, and football matches had been prohibited. He was not aware that restrictions of that kind had had any great effect. The disease was still going on in Germany, and recently they had had information to show that it was getting

worse. From March 1st to March 15th there were 25,000 outbreaks in Germany, almost twice as many as in February. That was over 80 times as many as we had had in the whole of the financial year 1937-38. It had also to be remembered that on the Continent the slaughter policy, which we could adopt because we lived on an island, was not practicable. That meant that infection was not wiped out, as it was here. In those circumstances it was hardly surprising that even more severe restriction on movement should be advocated.

One or two of the particular measures which Lord Nunburnholme advocated might not be quite as effective as the noble lord thought, and might make the position even worse. They might close down their parish life, but they could not close down the life of their birds, their ground game, their rodents, or their vermin. There were many who thought that children were less likely to carry infection from farm to farm or field to field if they merely moved across the accepted footpaths and highways to and from school than if they were turned loose to wander about the countryside for the greater part of the day. The Minister was already empowered to prohibit the use of footpaths by serving a notice on the occupier. These powers were exercised in relation to any infected premises, and no doubt on neighbouring premises where there seemed to be any risk in allowing the use of footpaths to be continued.

Tribute to Farming Community

The present regulations, necessary as they were, already caused sufficient loss and inconvenience. They represented what was practicable in this country and he thought, comparing the outbreaks of the disease here with those on the Continent, that their lordships would agree that they were effective. The Government would prefer to rely on the existing restrictions, and on the slaughter policy which strangled the disease at its birth, rather than on measures the inconvenience of which would outweigh any possible advantage which might be derived from them.

He understood that no policy of insurance under State management had been inaugurated, but that certain insurance companies, one if not more, accepted insurance. Therefore a farmer could take measures to compensate himself over and above the compensation provided by the State.

During the outbreaks of foot-and-mouth disease of the last six or eight months the work of the inspectors of the Ministry had been very greatly facilitated and aided by the co-operation of the farming community in notification of the disease at the very earliest moment. (Hear, hear.) He wished to pay a tribute, not only to the noble lord who had taken steps to safeguard his own area, but to the more general farming public which had followed his example and were taking similar measures in many cases to eliminate the risk, which they must admit was at the moment a formidable one, although they trusted that within a matter of only a few days it would appear less formidable than at present.

Viscount Dawson of Penn asked if any particular bird was thought to be guilty of spreading the disease.

The Earl of Feversham said that the outbreak in the autumn and winter which started in East Anglia and spread to Wiltshire and Somerset was associated with migrating birds landing on the East Coast and, in the course of their usual flight, going west. The committee set up to deal with the matter had much evidence submitted to it on that account and it was thought that, in particular, starlings might have been the means of carrying the virus. But up to the present he had no particular information which led to any conclusive proof as to whether or not migratory birds were the source of infection of the "O" type which broke out in the autumn and winter.

There was so far no evidence to show that the present outbreak was due to the flight of migratory birds or ruminating animals. The present spread of the disease was due to the fact that a large number of sheep—infected stock—were sold at Banbury Market and in the ordinary course of marketing operations went to all parts of England, except Durham, Northumberland, Westmorland, Cumberland, Devon and Cornwall.

The motion was, by leave, withdrawn.

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Dogs (Amendment) Act

The Dogs (Amendment) Act, which received the Royal Assent last week, was introduced by Sir Robert Gower on behalf of the Royal Society for the Prevention of Cruelty to Animals. In the past when dogs have been condemned to be destroyed for various offences, appeals have been made to Quarter Sessions, but recently it has been suggested that this right of appeal did not exist legally. The Act puts the matter beyond doubt by giving the statutory right of appeal to Quarter Sessions.

HUMANE TREATMENT OF ANIMALS

Sir Frederick Hobday, C.M.G., F.R.C.V.S., speaking at a luncheon of the New Health Club on April 13th, appealed to all who kept dogs or other pets to give them a square deal by rational feeding, veterinary diagnosis and treatment when ill and, most important, a painless death at skilled hands when the time came.

This country, which had 30,000,000 animals, was regarded as a pioneer against cruelty, yet sheep had been excluded from the law making humane methods of slaughter compulsory. Through the efforts of societies, many authorities controlling slaughterhouses had now adopted a bye-law that sheep must be rendered unconscious before the knife is used on the throat, and there remained only 515 houses still using the old methods. We owed it to animals that, when we wanted their flesh for food or their skins for clothing, the last rites should be performed painlessly.

Captain C. W. Hume, Hon. Secretary, University of London Animal Welfare Society, said that, while there was little wanton cruelty, opposition to humane measures often came from British commercial interests. There was strong agitation, for instance, for the removal of a duty of 1s. 3d. imposed in Nigeria on traps for catching antelope, which were in danger of extermination.

Dr. S. Henning Belfrage referred to the pigeon-shooting at Monte Carlo as a terribly brutal form of sport, and urged that a British boycott of that resort should be organised until it was abolished.

Sir Francis Fremantle, M.P., who presided, said that the veterinary profession had done much to help in solving medical problems, which to a large extent were common to the animal and human world. Hatred of cruelty lay at the root of British policy.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

April 25th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

April 29th.—Meeting of the Royal Counties Division, N.V.M.A., at Oxford, 4.45 p.m.

April 29th.—Meeting of South-Eastern Division, N.V.M.A., at Brighton, 2.45 p.m.

May 5th.—Last day for nomination for election to R.C.V.S. Council.

May 16th.—R.C.V.S. Examination in Animal Management begins.

May 19th.—R.C.V.S. Annual Report and voting papers issued.

May 26th.—Last day for return of voting papers, R.C.V.S. Council election.

June 2nd.—R.C.V.S. Annual General Meeting. Election of Council.

June 9th & 10th.—D.V.S.M. written examination.

June 13th.—D.V.S.M. oral examinations begin.

June 22nd & 23rd.—R.C.V.S. Committee Meetings.

June 24th.—R.C.V.S. Committee and Council Meetings.

June 30th & July 1st.—R.C.V.S. written examinations.

Aug. 21st-25th.—Thirteenth International Veterinary Congress, Zürich.

Aug. 26th-27th.—Thirteenth International Veterinary Congress, Interlaken.

Sept. 5th-9th.—Annual Congress, N.V.M.A., at Glasgow.

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STATE VETERINARY SERVICE

Superannuation Rules, 1936

We understand that all veterinary officers recently transferred from local authority to State service have been supplied with a memorandum setting forth the conditions under which they will become entitled to pension from the Civil Service and from the local authorities previously employing them.

The Association would draw particular attention to paragraph 14 of that memorandum, which provides for notice being given to the local authority relinquishing the right to the return of contributions where a pension from that source is desired in later years. One aspect of this requirement that needs to be borne in mind is that where an officer retires of his own accord from the Ministry's service before the lapse of a period qualifying him for a pension, he apparently not only loses the right to a pension from the local authority but is unable to claim the return of contributions to the Local Authority Superannuation Fund.

It is felt, also, that it would be of service to publish some explanation of the manner in which numbers 8 and 9 of the Superannuation Rules, 1936, affect the officers concerned.

Rule 8 provides that, subject to the exceptions set out in the proviso to Rule 8 (1), previous pensionable local authority service shall be taken into account for the purpose of determining whether an officer who has accepted the rules on entering the Civil Service has completed the minimum periods of service required to qualify him for various benefits under the Civil Service Superannuation Scheme. The qualifying benefits and periods in question are:—

Pension (including superannuation allowance, compensation allowance and retiring allowance).	10 years
Additional Allowance (the lump sum payable on retirement in addition to pension or short service gratuity).	2 years
Death Gratuity (normally one year's pay).	5 years

Under Rule 9 when the officer retires from the Civil Service in circumstances in which he is eligible for a superannuation allowance and assuming that contributions have been left in the local authority superannuation fund, the local authority must similarly take into account his subsequent civil service for the purpose of determining whether he has become *entitled* to a superannuation allowance from them. For example, assuming that the minimum period of service required for a local authority pension is ten years (as is the case under the Act of 1922 and most local Acts), and that the officer's pensionable service had been: local authority service, five years; Civil Service, five years, he would become entitled to a pension from each employer, always provided that he is retiring from the Civil Service in circumstances which qualify him for a superannuation allowance, *i.e.*, at age 60 or over or for permanent ill-health.

If, however, his total pensionable service (local authority plus civil service) is less than ten years, he would not be eligible for a superannuation allowance under the Superannuation Acts and would not, therefore, be eligible for a pension from the local authority.

If at the date of his transfer to the Civil Service, the officer was a pensionable officer of a local authority and if the pension scheme of his local authority was a contributory one (as under the Act of 1922) he must have had some contributory service before he left the service of the local authority. If, however, he was not a pensionable officer of a local authority at the date of transfer he may subsequently under Section 26 (2) of the Agriculture Act, 1937, become entitled to be treated as if he had been one: in that case all his local authority service will be non-contributory.

In either case any non-contributory service which is taken into account for the local authority pension will be similarly reckoned towards the minimum service of ten years required for the award of a pension under the Superannuation Acts, and, if the total pensionable service is ten years, will be recognised for the purpose of calculating the local authority pension. (The special arrangement under Section 17 of the Act of 1922, by which if contributory service is less than ten years, it is treated as if it were non-contributory, does not apply in these cases).

Each employer takes into account service under the other employer *only for the purpose of*

the minimum qualifying periods, not for the purpose of calculating the amount of the pension itself. The Civil Service pension (and additional allowance) will be calculated on completed years of civil service only, and on the officer's pensionable salary when he retires from the Civil Service (*i.e.*, his average annual salary for the last three years of civil service, or for his total civil service if this is less than three years). Similarly, the local authority pension will be calculated on his completed years* of pensionable local authority service,† if he is pensionable under the Act of 1922, and upon his average pensionable salary for the five years preceding his transfer to the Civil Service.

Provided that his total pensionable service (local authority and civil service) amounts to at least five years, if a transferred officer dies while employed in the Civil Service, a gratuity of at least one year's pay will be payable to his legal personal representatives.

While the foregoing observations are proffered for the guidance of those of our members who have transferred to the new service, it must be realised that if there is any inconsistency between the terms of this memorandum and the actual provisions of the rules, the latter must prevail.

*Under the Act of 1922, a period of non-contributory service exceeding six months is treated as a completed year for this purpose.

†In the case of broken service, this is subject to the proviso to Rule 8 (1), *i.e.*, provided that it has not been disposed of already by the return of contributions or by the award of a superannuation or compensation allowance.

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PERSONAL

Forthcoming Marriage.—A marriage has been arranged to take place on April 30th, 1938, between Marjorie Ann, daughter of Mr. and Mrs. E. Sparks, of Great Malvern, and David Leslie, son of Mr. and Mrs. J. Hughes, of Kenton, Middlesex.

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FOOT-AND-MOUTH DISEASE

Standstill Order Lifted on Easter Monday

The general restriction of April 4th against the movement of cattle over the greater part of England in consequence of foot-and-mouth disease was lifted on Easter Monday. The following official statement was issued on Wednesday of last week:—

"The Minister of Agriculture announces that an Order has been made by him to-day releasing, as from Sunday midnight, April 17th, the controlled area to which the foot-and-mouth disease Standstill Order was applied on April 4th. The Revocation Order will take full effect on Easter Monday, provided that no further development occurs to render its cancellation necessary. The Order will not affect the operation of the restrictions now applying to actual infected areas. The Order, made on April 4th, affected practically the whole of England. Only six counties—Northumberland, Westmorland, Cumberland, Durham, Devon and Cornwall—were exempt."

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LONDON VAN HORSE PARADE

There was a gratifying increase of 52 in the total number of entries (540) for this year's show of the London Van Horse Parade Society, which was held in Regent's Park on Easter Monday.

The veterinary surgeons who examined the entries stated that the standard was higher than they have known it for years. No horse had to be rejected for lameness and 534 were given first-class awards. The leading exhibitors were United Dairies, with 81 entries; Price and Co., bakers, with 65; and Carter Paterson, with 32. There were the usual family parties, and several "pearly kings" and "queens." The youngest entrant was eight-year-old Doris Hutchings, who drove her three-year-old pet pony, Kitty Kate; and the most unusual entry was a pony-drawn piano-organ entered by Mr. A. G. Turner, of Shoreditch. The prizes were distributed by Mrs. Goddard, wife of Mr. Claud F. Goddard, who drove to the parade in his four-in-hand "Tally ho."

Mr. Goddard, who presided at the luncheon after the parade, referred to the loss the Society had sustained through the death of Mr. Bertram Mills, and the company stood in silence in his memory.

Major H. Faudel-Phillips, President of the National Horse Association, and one of the judges, said that those who wished to turn the horse off the London streets did not realise how many men made a living out of the pony and cart. One heard old ladies say, "The poor horses breathe nothing but petrol." After seeing the excellent condition of the horses which had taken part in the parade he was tempted to buy some petrol for his own horses. (Laughter.)

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THE LONDON ZOO

It is stated in the annual report of the London Zoo that the two open evenings a week at the Zoo during the summer months will be confined to Wednesday and Thursday evenings during June, July and August, this year. Last year the number of visitors after 6 p.m. totalled 65,500.

Queen Mary, at her "express wish," was elected a Fellow of the Zoological Society during the year. The Earl of Onslow is nominated for re-election as President of the Society, and Professor Julian Huxley as Secretary.

Contrary to expectations, the attendance of visitors during the Coronation year—1,946,897—was slightly less than that for either of the two previous years, although the decrease was well under 1 per cent. of the total. At Whipsnade there was a record attendance of 546,418, the increase being 13 per cent., against an increase of under 3 per cent. the previous year. Over 97,000 visitors paid for admission to the Pets' Corner at the London Zoo, and over 92,000 photographs were taken.

The total income at Regent's Park was £125,060, and the expenditure £117,487. Admissions of visitors accounted for £62,929 of the income, and Fellows' subscriptions for £22,650. At Whipsnade the total income was £35,996, and the expenditure £28,306. For Whipsnade and Regent's Park combined an excess of income over expenditure of £15,262 was carried to the general balance sheet.

During the year the animals at Regent's Park consumed 120 tons of hay and 162 tons of clover, while 101 tons of straw was also used. Other items include 249 tons of horse flesh, nine tons of monkey nuts, 246,707 bananas, eleven tons of bread, and five-and-a-half hundredweight of honey.

It is report that at Whipsnade 22 wolves died from wolf septicaemia and two wild cats from

cat distemper. On the other hand, the Zoo succeeded in rearing a brown bear, a wild horse foal, a male Bactrian camel, four tiger cubs, a female giraffe and two ostrich chicks.

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R.C.V.S. CENTRAL LIBRARY FOR ANIMAL DISEASES

Recent acquisitions by the Library include the following:—

Books.

Allen, J. A., and McLure, W. C. S. Theory and Practice of Fox Ranching. 1926.

Bradley, O. C. Structure of the Fowl. Second edition, revised. 1938.

Dollar's Veterinary Surgery, General, Operative and Regional. Third edition, ed. J. J. O'Connor. 1938.

Frateur, J. L. Age of the Horse According to the Teeth. 1923.

Gaiger, S. H., and Davies, G. O. Veterinary Pathology and Bacteriology. Second edition. 1938.

Grindley, G. C. The Intelligence of Animals. 1937.

Markowitz, J. Text-book of Experimental Surgery.

Pamphlets.

Freney, M. R. Studies on the Chemotropic Behaviour of Sheep Blow-flies. 1937. (Council for Scientific and Industrial Research, Australia.)

Kelley, R. B. Studies in Fertility of Sheep. 1937. (Council for Scientific and Industrial Research, Australia.)

Lewis, E. A. Sheep Scab: Remedial Measures Reviewed. 1937.

Sydney University. Many Reprints. 1937.

Dissertations.

Leipzig University. Seventy-one Dissertations. 1936-38.

Münich University. Twenty-five Dissertations. 1935-38.

. . . . .

Information about the library services will be found on p. 68 of the Register of Veterinary Surgeons: also a list of the periodicals received in the library.

Library Catalogue.—A printed catalogue of the text-books in the library published since 1900 is available, price 1s. post free. This comprises both an author and subject list, together with an author list of books added to the library between the date of publication and November, 1937. Any further supplementary lists published will be sent free to purchasers of the catalogue.

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ESTIMATES FOR AGRICULTURE

The Civil Estimate for the Ministry of Agriculture and Fisheries shows an increase of £637,677 as compared with 1937. The gross expenditure under salaries, etc., and travelling expenses, amounts to £826,439, an increase of £209,359. The increase is due almost entirely to the additional activities of the Ministry under the 1937 Act, particularly in connection with the new State Veterinary Services.

Expenditure on matters connected with live-stock includes £825,000 in respect of diseases of animals. The estimate for 1938 includes £800,000 for grants to the Diseases of Animals Account, comprising £145,000 for foot-and-mouth disease, £23,000 for swine fever, £623,000 in connection with the campaign for eradication of tuberculosis in cattle, and £9,500 for other diseases. A sum of £57,600 is provided for improvement of livestock by grants to farmers and societies of farmers to assist in the provision of high-class heavy horse stallions, bulls, boars, rams and goats, and in the recording of milk yields of cows.

* * * * *

"THE COLOURING OF ANIMALS FOR SHOW PURPOSES"

The above heading, so frequently to be observed in agricultural journals, gains a novel and a wider significance from the appearance in a daily newspaper of an advertisement inviting fashionable ladies to have their "dogs tinted to match their dresses for special occasions. Prettiest pastel shades imaginable." A member writes, in this connection: "May we expect to see hunters in the near future dyed various fashionable shades to match the riders? Or perhaps the various farm animals may be made to match the scenery!"

* * * * *

SKIMMED MILK FOR SCHOOL CHILDREN

The more extensive use of skimmed (separated) milk which has been advocated by the Technical Commission on Nutrition of the League of Nation's Health Organisation is made the subject of comment in a recent *Lancet* annotation, as follows: "Large quantities of this type of milk are available at butter factories at a very low price. Since it contains the nitrogen, carbohydrate, and mineral fractions of the milk, it has a high nutritive value for human beings. The difficulty, as pointed out in another report of the League,* consists largely in distribution. By the time the skimmed milk has been brought to the towns, pasteurized and bottled, its price, so far as calorie value is concerned, will be very much the same as that of whole milk. An alternative method was, therefore, suggested of supplying the separated milk in dried form. It is interesting to note that observations are already available to prove the value of this method. Aykroyd and Krishnan,† in India, found that the addition of liquid skimmed milk reconstituted from powder to the diet of children in residential hostels brought about an acceleration in growth and a decided improvement in general condition. In a more recent paper, Krishnan and Mitra‡ report two experiments made on children of the poorer classes in Madras. In the first experiment 20 boys were given daily 8 oz. of liquid skimmed milk for three months, while 20 similar boys received no addition to their diet. The average increase in both weight and height was notably greater in the former than in the latter group. In the second experiment 24 boys and 18 girls were given daily 8 oz. of skimmed milk reconstituted from powder, while a similar number of boys and girls were given 1 oz. of wheat-flour biscuit of about the same calorie value. At the end of ten weeks the weight and height increase among the boys in the milk-fed group was manifestly greater than in those of the biscuit-fed group. Among the girls the increase in height, but not in weight, was manifestly greater in the milk-fed group. These experiments demonstrate the benefit that results from giving a ration of skimmed milk to school children who are receiving an inadequate or unbalanced dietary in their homes. The cost in the second experiment of supplying a child daily with 8 oz. of skimmed milk reconstituted from powder was 12 annas a month, or in our currency less than a half-penny a day."

Quart. Bull. Hlth. Org. L. o. N.*, 1937, **6, 371.
†*Ind. J. med. Res.*, 1937, **24**, 1093.
‡*Ibid.*, 1938, **25**, 647.

ACTION OF MOLYBDENUM IN NUTRITION OF MILKING COWS

In a letter to *Nature* (March 26th, p. 553), W. S. Ferguson, A. H. Lewis and S. J. Watson write that a large area under pasture in Somerset cannot be grazed by cows during the normal grazing season (April to October) without milk yields falling rapidly, causing marked loss of condition and even death. The disorder, which has been known for very many years, is marked by extreme diarrhoea; other cattle and sheep also scour on such herbage, though the loss of condition is not so obvious as with the milking animal. Such fields are described as being "teart." The area involved is estimated at about 20,000 acres by Gimingham,* and the annual loss to the farming community must be very great. The available information seems to rule out bacteria, parasites, water supply or a particular herb as causal agents, and points to the presence of some constituent of the soil taken up by the herbage.†

Spectographic examination of a few samples kindly supplied to the writers by Mr. A. W. Ling and Mr. W. R. Muir, of the University of Bristol, showed the presence of molybdenum in "teart" herbage. A more extensive and systematic examination which was later conducted on "teart" and "non-teart" fields in Somerset confirmed the fact that the molybdenum content of "teart" herbage was considerably higher than that of the "non-teart" fields situated close by.

There was no apparent correlation between the total of HCl-soluble molybdenum of the soil and that of the herbage. Comparisons were, however, complicated by the fact that "teart" and "non-teart" fields were managed in such a way that the herbage was at different stages of growth at any one time of the year.

The writers fed soluble molybdates in quantities equivalent to those provided in an average daily ration of really "teart" herbage (1 to 36 gm. Mo per head per day) to five dry cows at Jealott's Hill Research Station, Bracknell, Berks, and in three cases produced extreme scouring and loss of condition similar to that which occurs in "teart" fields in Somerset. Whether the molybdenum is directly responsible or whether it catalyses a toxic product in the rumen is not known. It is generally stated in the "teart" areas that horses are not affected, but it is impossible to say at present if this is due to the simple stomach or to differences in grazing habit.

The investigation is still being pursued. The writers record their thanks to Mr. Milbourn of I.C.I. (Metals), Ltd., for the spectographic examination of the early samples from Bristol.

*Gimingham, C. T., *J. Board Agric.*, **17**, 529 (1910).
†Muir, W. R., *Agric. Progress*, **13**, 53 (1936).

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THE ONTARIO RESEARCH FOUNDATION

During the course of the report of the Ontario Research Foundation for 1936, a summary of which appears in *Nature* (April 9th), it is recorded that a microscopic method for the early diagnosis of bovine mastitis has been worked out by the Division of Pathology and Bacteriology, while other work of the Foundation has been concerned with the deodorisation and partial hydrogenation of cod liver oil without destroying the vitamin content.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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DOCKING—SOME REFLECTIONS

To the Editor of the Veterinary Record

Sir,—I have long thought along the same lines as those taken by Mr. Wm. A. Campbell in his letter of last week, and concur entirely in his view that it is time we veterinary surgeons got together and tried to come to some agreement as to just what constitutes cruelty to animals. At the same time, I agree thoroughly with the opinion expressed by Mr. E. W. Little in his paper "Veterinary Jurisprudence" that "where the act is repugnant to the finer human instincts and where we can only hazard an opinion that the animal did not suffer, *we should give the benefit of the doubt to the animal.*"

Mr. Campbell goes on to say: "Why all this silence in the profession over the passing of the Docking and Nicking (Prohibition) Bill?" Well, I, for one, am hoping that in this particular case silence gives consent. Like him I have docked hundreds of horses, many of them before the days of anaesthetics (with consequent danger to life and limb), but, unlike him, I have come to the conclusion that it is unnecessary and cruel. Perhaps not immediately cruel as performed nowadays, but leading to subsequent cruelty in the healing of a large wound and in robbing the animal of its natural fly whisk.

Is it not entirely a fashion? I drove horses docked and undocked for a matter of 20 years before changing over to motors, and I cannot remember any trouble through getting a rein under the tail of an undocked horse. Two years ago I had a lengthy discussion of this problem with the late Bertram Mills (a most courtly controversialist), and I almost, if not quite, convinced him that it was really unnecessary. I distinctly remember his last remark: "I still cannot quite make up my mind on the subject. Perhaps, after all, it is largely a matter of fashion."

A final point: it has always been—as far as my information goes—an unofficial operation, inasmuch as it has never been taught in the Colleges (or mentioned in the text-books). I never heard it mentioned during my collegiate course, but remember seeing in the College library a small book thoroughly condemning it (that was in 1892), written by either Fleming or Hunting, I think. Could we see a docked horse for the first time I feel sure we should exclaim: "How ugly."

Like Mr. Campbell I have never seen or heard of the operation of nicking. But I saw a nicked horse in Exhibition Road, South Kensington, last spring, and they have at least one pair of nicked horses at Hollywood. I think I last saw them in the film "Little Lord Fauntleroy."

Yours faithfully,

R. Glave Saunders.

Little Haccombe,
Exeter.
April 18th, 1938.

PSEUDO-TUBERCULOSIS OF SHEEP

(*Cheesy broncho-pneumonia or caseous lymphadenitis*)

Recent investigations, especially post-mortem examinations, have shown that pseudo-tuberculosis of sheep is much more common than was formally thought to be the case. It has been established that the disease is caused by the Bacillus pseudotuberculosis ovis (bacillus of Preisz and Nocard).

When there is a Preisz-Nocard infection of the lungs it is manifested by symptoms of chronic broncho-pneumonia; the progression of the disease is slow, the patients gradually become emaciated, anæmic, and finally die from cachexia. Some animals demonstrate the infection by the presence of painless tumours, chiefly in the prescapular and precrural regions. In other cases the morbid changes are limited to the internal organs and the disease is rarely discovered until the animals are slaughtered; such animals usually appear quite healthy or show only indefinite symptoms of gradually increasing anæmia or cachexia.

PREVENTION

In flocks where there are affected sheep the infection of lambs is inevitable. The bacilli gain entry into the organism per os *and through the umbilicus. Immunisation by means of a Preisz-Nocard Bacillus Vaccine* (PYOVIX) *has proved generally successful. It is, of course, necessary to supplement the vaccine injections by appropriate local antiseptic treatment of the umbilicus and also of the tail after docking.*

PYOVIX is a pluri-valent vaccine, including a fine emulsion of stabilised and sterilised Preisz-Nocard bacilli. The general practice is to inject the lambs within 15 days of birth; a single dose of 1 c.c. is sufficient. Reactions, with the vaccine, are rare. PYOVIX is also used for curative treatment.

PYOVIX

Preventive and Curative

PHIAL OF 10 C.C. PRICE 2/6

Supplied to Veterinary Surgeons only

A leaflet, giving the technique of use, will be supplied to any Veterinarian on request

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VETERINARY DEPARTMENT

LOUGHBOROUGH, LEICESTERSHIRE

NOTICES

ORIGINAL Articles are only accepted on the understanding that the "Veterinary Record" has priority of publication.

"VETERINARY RECORD" AND CHANGES OF ADDRESS

READERS are asked to inform the General Secretary of any change in their address by THURSDAY MORNING if they wish the following Saturday's issue of "The Veterinary Record" to be sent to the new address.

The publication of this notice is prompted by the recent increase in the number of readers who notify change of address on Friday and Saturday, when it is too late for any alteration to be effected before the following week.

THE Editorial Committee of the N.V.M.A. will be glad to receive from practitioners reports of cases likely to prove of interest to readers of this journal.

It is suggested that, wherever possible, the adoption of a uniform method of recording cases is desirable, and the following is issued as a guide for the recording of clinical cases for publication.

Records should be as complete as possible, concise, and written in the third person. Photographs, radiographs, sketches and diagrams should be submitted if advantageous.

When describing lesions, dimensions should be indicated as far as possible by measurements, or by comparison with common objects.

Subject.—Age, sex and breed. In the case of cross-bred small animals—approximate bodyweight.

History.—Duration of disease. History of in-contacts. Nature of onset and course. Diet. Previous medical history.

Examination.—Eyes, ears, skin, mouth and teeth. Limbs and action. Thorax, abdomen, urinary and genital tracts. Examination of urine, faeces, discharges, skin scapings.

Diagnosis or differential diagnosis.

Prognosis.

Treatment.—In surgical cases details of anaesthesia and operation.

Course of Disease.—Outcome.

Post-mortem Examination.—Record should be comprehensive and findings carefully described.

Discussion.

NOTICES

Glasgow Calling

ALL members of the N.V.M.A. to rally round the President on the occasion of this year's Congress.

By so doing the profession can show their feeling of gratitude to the man who has guided the Association through a chapter in the life of the profession which is now history.

His motto has been "Labour Conquers Everything" and his guiding principle, "Unity;" that principle has enabled all of us to retain all that makes for our individual happiness, and gives us the privilege and opportunity of working for the common good of the State.

We, the members of the Provisional Committee, who have had the privilege of working with Mr. Campbell in the preparation of this year's programme, have no hesitation in saying that the members who support him will also benefit themselves.

The programme has been so arranged that in each paper there is a side for every section; the readers, openers and demonstrators are personalities who are masters of their subjects.

The social functions, while following the usual schedule, need no words to conjure up the feeling of good fellowship with which they are always endowed.

We are not really capable of describing the beauty of Scotland's scenery that is yours to behold on the tours, by land and sea, which have been arranged.

Old Moore, in his Almanack, says the weather will be glorious—that is all we hope for the outings.

And the venue of the Congress! The Empire Exhibition in Bellahouston Park! Almost sufficient in itself in beauty, interest and amusement.

You Cannot Afford to Stay at Home

Royal Veterinary College and Hospital, Camden Town, London, N.W.1.

"REFRESHER" COURSES FOR PART-TIME VETERINARY OFFICERS

A FURTHER course, which will probably be the last of the series, will be held at the College between Tuesday, May 10th, and Thursday, May 18th, 1938, inclusive. Fee £3 3s.

Applications to attend the course should be addressed to the Secretary.

South-Eastern Division, N.V.M.A.

A MEETING of the above Division will be held at the Old Ship Hotel, Brighton, on Friday, April 29th, 1938, at 2.45 p.m.

AGENDA

Routine.
R.S.P.C.A. Free Treatment Schemes.
Poultry Course.
Annual Veterinary Congress at Glasgow.
Paper: "Clinical Manifestation of Brucellosis in Farm Stock," by Major Frank Chambers, O.B.E., F.R.C.V.S., Wolverhampton.
Morbid specimens.
Any other business.

W. P. BLOUNT, *Hon. Secretary.*